Clamp for a manifold for fluid distribution

The present invention relates to a clamp for a manifold for fluid distribution. It also relates to a manifold that can be clamped with the aid of a clamp according to the invention.

The fields to which the invention relates are essentially the following fields: hot and cold water, central heating, low-temperature floor-heating and floor-cooling. Clearly, other fields in which a fluid - water but also other hydraulic fluids - is sent to a manifold before being distributed to different parts of a hydraulic system are also relevant.

In a hydraulic installation, there are generally two manifolds. One manifold receives the fluid from a source and distributes it to different parts of the hydraulic system, while the other manifold collects the hydraulic fluid arriving from the different parts of the hydraulic system to discharge or return it to source. The manifolds in such situations are generally mounted in a cabinet or service shaft. Of course, other positions for these manifolds are possible.

As a rule, the manifolds are clamped in a cabinet, or the like, with the aid of collars. Each collar is made of two parts, half-rings or yokes, connected together by two screws. One part is clamped to a supporting plate while the other part and the two screws are separate elements. A fitter must therefore assemble a half-ring or a yoke and two screws in order to be able to fix a manifold in position. Then, to fix the manifold in position, he must fit the half-ring or the yoke on the component clamped to the support and then tighten the two screws.

It is an object of the present invention to provide a manifold clamp that offers easier mounting than the clamps (collars) of the prior art.

To this end, the device that it proposes is a clamp for a manifold for fluid distribution comprising a supporting plate for holding the manifold.

According to the invention, at least one pin, into which a screw is screwed at right angles, is mounted on the supporting plate.

In this way it is a simple matter to place the manifold in position and pivot the pin to bring the screw in a housing provided for this purpose on the manifold. On then tightening the screw, the manifold is clamped.

For preference, each pivoting screw is captive-mounted. The screw is thus integral with the clamp and cannot escape. The fitter is therefore certain to have the necessary screw to hand for clamping the manifold.

For clamping a manifold, two pivoting screws can be provided on either side. Each screw is thus engaged on one side of the manifold that is being clamped. It is equally possible to provide only one screw when the manifold is fastened, at least locally, against a wall. In order that mounting can be done easily under all circumstances and with the greatest possible ease, the clamp according to the invention advantageously comprises a pivoting screw and, opposite this pivoting screw, a fixed clamping tab. A manifold to be clamped is then positioned against the clamping tab and the screw is pivoted and tightened to hold the manifold in position. In this embodiment, the clamping tab advantageously includes a central portion of reduced width for locating between two clamping arms of a manifold. This embodiment holds the manifold better.

A double clamp according to the invention is in the form of a bent metal strip, at the two ends of which is a clamp as described above.

The present invention also relates to a fluid-distribution manifold comprising a tubular body having a longitudinal axis with at least one radial outlet, the manifold being characterized in that it comprises on two opposite faces, two clamping yokes, each comprising a base attached to the body of the manifold and two arms extending in an essentially transverse direction. This manifold can therefore be clamped equally well by a clamp according to the invention that comprises a clamping tab and a pivoting screw as by a device comprising two pivoting screws.

Each yoke is for example U-sectioned and extends along an axis perpendicular to the longitudinal axis of the manifold and to the radial outlet(s) of this manifold.

Each yoke preferably has two notches at one end to take a clamping tab, the latter exerting, when fitted, a stress on the yoke toward the supporting plate.

Lastly, the invention also relates to a module for a fluid-distribution manifold, comprising a tubular body extending along a first axis in which at least one radial outlet is made, the module being characterized in that it comprises on two opposite faces, two clamping yokes, each comprising a base attached to the tubular body and two arms extending in an essentially transverse direction with respect to the first axis.

On this module, each yoke advantageously is U-sectioned and extends along an axis perpendicular to the first axis of the module and to the radial outlet(s) of this module.

Each yoke preferably has two notches at one end to take a clamping tab, the latter exerting, when fitted, a stress on the yoke toward the supporting plate.

However, a clear understanding of the invention will be gained from the description which follows, with reference to the accompanying schematic drawing, showing by way of non-restrictive example, a preferred embodiment of a clamp according to the invention.

Figure 1 is a perspective view showing a clamp according to the invention and a module of a manifold before the manifold is mounted, and

Figure 2 is a front view of a clamp according to the invention and of two manifolds.

Figure 1 shows a clamp according to the invention and a module 2 of a fluid-distribution manifold.

The clamp is in the form of a plate consisting of a bent metal strip 4. Here, it resembles a tray, at either edge of which is an approximately horizontal flat arm 6. Each of these flat arms is designed to hold a module 2. At each end of the strip 4, which corresponds also to one end of each flat arm 6, is a clamping tab 8. The latter extends vertically from the edge of the flat arm 6, at right angles thereto. This clamping tab 8 takes the form of a rectangular strip with a narrowing 10 occupying a height H. This narrowing 10 consists of a portion of reduced width.

Facing each clamping tab 8, on the opposite edge of the flat arm 6, is a screw 12 mounted in a pivoting manner. It is supported by a pin 14, to which it is perpendicular, the pin 14 itself being mounted in bearings 16 formed in the strip 4. The pin 14 is a solid circular cylindrical rod with a transverse tapped hole through its middle to take the screw 12. The pin

14 is mounted transversely relative to the strip 4. The bearings 16 are made by local cutting and bending of the strip 4. Longitudinal slits are made so as to form metal bands. The central metal band is chopped out. The bearings 16 are formed by bending the other metal bands, alternately down and up, to create a housing for the pin 14. The pin 14 is then inserted between the bearings 16, and the screw 12 is screwed into the tapped hole provided for this purpose in the pin 14. The pin 14 is thus in a horizontal plane and the screw can pivot into a vertical plane. In a pivoted position, the screw is opposite the clamping tab 8.

It is possible to make the screw captive. So, for example, using a punch, the free end of the threaded part of the screw can be expanded. It is thus no longer possible to remove the screw from the pin 14. It is also possible to simply place a nut on the threaded end of the screw after the screw has been inserted through the tapped hole of the pin 14.

The module 2 consists essentially of a body 18 molded from synthetic material. This body 18 is a tubular body of axis 20 having two radial outlets 22. Water, or some other hydraulic liquid, arrives, for example, in the module 2 along the axis 20 and departs through an outlet 22 at right angles to this axis 20. The pin 14 is approximately parallel to the axis 20 of the module 2 while the clamping tab 8 extends at right angles both to the axis 20 and to the axis of the radial outlet 22.

At one end (on the right in figure 1), the tubular body 18 has a male connector 24. The other end of the module 2 has a female connector 26 designed to take a male connector 24 of another module 2.

At the male-connector end 24, the tubular body 18 has two diametrically opposite lugs 28. These lugs 28 each contain a bore 30 that extends in a plane perpendicular

to the axis 20. At the other end of the tubular body 18, that is to say at the female-connector end 26, the module 2 has two projections 32 projecting longitudinally from the tubular body 18. At each end of each projection 32 is a bore 34. These bores 34 are parallel to the bores 30 formed in the lugs 28. These bores 34 and 30 are located in such a way that when a male connector 24 of one module 2 is inserted into a female connector 26 of another module 2, these bores 30 and 34 will be aligned. The two modules 2 can then be fastened together with the aid of a clasp in the form of a stirrup, not shown in the drawing.

Parallel to the lugs 28, the tubular body 18 also carries two clamping yokes 36. These are each in the form of a component of constant U section. The length of this constant-section component is less than the height H of the narrowing 10 of the clamping tab 8. The clamping yoke is an integral part of the molding of the tubular body 18. This yoke has a base 38 connected to the tubular body 18 and two arms 40 that extend generally in a transverse plane relative to the axis 20 of the tubular body 18. The two clamping yokes 36 are symmetrical about the axis 20 of the module 2.

The module 2, or a manifold incorporating this module 2, is then mounted in the following manner.

A clamping tab 8 is first inserted into a clamping yoke 36 as shown on the right in figure 2. A slight inclination of the module or of the manifold may be necessary for this purpose. The manifold, or the module 2, is then rested on the flat arm 6 of the clamp. The narrowing 10 of the clamping tab 8 is located in such a way that the clamping yoke 36 is level with this narrowing 10. For more secure clamping, two notches 42 may be provided at the upper end of the clamping yoke 36, as shown in figure 1. In this way the enlarged upper end of the clamping tab 8 can be housed in the

notches 42. The module 2 or the manifold is thus more firmly immobilized. The relative position of the narrowing 10 and of the clamping yoke 36, and also the depth of the notches 42, means that the module 2 remains in an inclined position, as shown on the right in figure 2 if it is not pressed firmly on to the flat arm 6 of the strip 4. Once the module 2 or the manifold is placed on the flat arm 6, the screw 12 is pivoted and takes its place in the other clamping yoke 36. The screw 12 is then simply tightened to give an excellent clamping of the module 2 or of the manifold of which it is a part. When the screw 12 is tightened, the module is pressed against the flat arm 6. There is therefore an elastic stress in the clamping tab 8 on the clamping yoke 36 which keeps the module in position on the flat arm 6. A force acting on both sides of the module 2, through the screw 12 and through the tab 8, ensures that the module 2 is securely held on the clamp according to the invention. The left-hand side of figure 2 shows a manifold clamped to a flat arm 6. The module 2 is here resting flat on the flat arm 6.

As can be seen, this fitting is very simple to carry out. There is no need to hunt about for separate screws and components. The module or manifold has simply to be correctly positioned and a screw pivoted and then tightened.

As shown in figure 2, a bracket 44 can be screwed to the clamp according to the invention. This assembly is then for example mounted in a cabinet or service shaft by snap action or any other means.

As is self-evident, the invention is not limited to the embodiment described above by way of non-restrictive example; on the contrary, it encompasses all alternative embodiments within the scope of the claims below.

Thus for example, to clamp a manifold, or a manifold module, two pivoting screws could be provided, one as described above and the other in the place of the clamping tab. In certain particular cases, a single pivoting screw may be found to be sufficient. Similarly, each screw could be screwed not directly into a pin but into a component integral with the pin.

The invention can be applied to any type of manifold, whether of modular design or otherwise, and made of synthetic or metallic material, for any type of application. If the manifold is composed of modules, the latter may of course differ from that described above by way of example.